



ALE

Where  
Everything  
Connects



## Networks and Communications for the Railway Industry

Secure, high quality solutions connecting  
passengers, staff and systems

# The connected railway delivers better communications, efficient operations, improved safety and security

Every player in the railway industry – from metro and light rail operators, to intercity rail and high-speed rail operators – is looking to deliver the best-possible door-to-door traveler experience for their passengers. At the same time, they all need to attract more passengers and enable a more connected experience while keeping operational costs down and expanding safety and security measures.

To move ahead in the face of rising competition and rising costs, railway operators need to continuously innovate and adopt new technologies. This is the only way they can improve the passenger experience and securely manage their rail infrastructure while improving safety and security for people and systems.

## Support more devices, simply and securely

Today, on-board and on-track sensors can deliver real-time information, analysis and status monitoring capabilities that help railway operators identify problems before they cause delays or accidents. But to get the information back to the right systems, every sensor needs to be connected to the network. The same is true for CCTV cameras, Wi-Fi access points and many other devices.

Supporting all of these connected devices – the Internet of Things (IoT) – on a large scale means railway operators need to consider new architectures for networks, new patterns for network traffic, and new security measures.

## Efficiently manage cyber security

Like all businesses, railways are vulnerable to cyber security attacks that can cut off access to commercial and business applications, compromise passenger information, and even put railway operations at risk. While Ethernet, IP and a converged network bring many benefits to railway operations, integrating subsystems also increases the risk that an isolated threat could become a much bigger problem.

As a result, every railway needs a comprehensive approach to cyber security and a strong containment strategy.



## Automate emergency and security procedures

If an emergency or security breach occurs, personnel from different services and organizations need the ability to instantly connect with one another. And they need automatic notification of events so they can quickly gather and act on key information from video systems, sensors and alarm systems using a radio, a fixed-line phone or a mobile phone.

## Transform to support a digital world that's on-the-move

To successfully run a railway in a hyper-connected, digital world, railway operators need secure networks and communications solutions that are designed to meet their unique requirements.

ALE provides the innovative solution building blocks needed for wired and wireless LAN networks, communications and applications. And they are all designed to help railway operators deliver a better passenger experience, run more efficient operations and improve safety and security.

# Give passengers a better door-to-door experience

Adding innovative communications and applications gives rail operators new opportunities to engage passengers and interact with them at every stage of their journey.



## Stay in touch with every move

Use voice, web and mobile applications to make the passenger journey easier and more enjoyable from door-to-door. Proactively provide information. Integrate chat, voice and video to give passengers a personalized multimedia experience. With ALE communication solutions you can provide:

- User-friendly, automated services that make it easy for travelers to book tickets and get information
- Up-to-the-minute information about departure platforms, schedules or delays
- Real-time responses to requests for assistance

## Keep people connected

When they're traveling, people expect to be able to access Internet and entertainment services just like they do at home. So let passengers easily, automatically and securely, connect to your Wi-Fi network from anywhere in the station or on-board the train.

## Help people find their way

Combine cloud-based collaboration with location-based services and applications to help people find their way. Now, travelers can get to the right place at the right time – whether that's a departure platform, a lounge, shops, restaurants or the nearest washroom.

## Make it happen

To give passengers a better door-to-door experience, ask about our:

- Rainbow cloud-based collaboration platform
- Communications application programming interface (API)
- Way-finding solutions
- Wi-Fi and access solutions

# Converge networks to simplify and accelerate operations

Moving railway operations from multiple separate networks to a converged mission-critical architecture, reduces the number of networks to be supported and dramatically simplifies network command and control requirements.

Railways can now support any combination of network solutions without compromising safety or security. And IT staff can become more productive and efficient. Integrating open platforms, such as new cloud-based applications and a management platform, into the operations control center further simplifies and accelerates day-to-day operations.

A mission-critical architecture can support:

- **Safety-critical networks** that are highly reliable, resilient and based on open standards to enable extremely fast signaling and secure communications.
- **Business-critical networks** that are self-healing and include automated provisioning so they are faster and easier to deploy, configure and manage.
- **Non-critical networks** that provide passenger entertainment and commercial TV services and are easy to remotely monitor and manage.
- **Ruggedized switches and routers** so railway operators can bring sophisticated capabilities to harsh environments such as railway tunnels and track-side applications.
- **Smart analytics** that give railway operators the application and network visibility they need for more efficient use, control and planning, and simplified management.
- **A robust voice communications platform** that is integrated with the railway information system so the different teams in the railway ecosystem can use unified communications and real-time, multimedia collaboration applications to work together.
- **A notification server** that automatically sends the right information to the right team at the right time to accelerate analyses and decision-making.
- **Cloud-based collaboration** that connects individuals and teams with integrated business processes and emergency services whenever needed.



## Make it happen

To simplify and accelerate railway operations, ask about our:

- Converged network infrastructure for voice, data, fixed and Wi-Fi communications
- Intelligent Fabric (iFab) and Shortest Path Bridging (SPB) technologies
- Ruggedized switches and routers
- Smart analytics applications
- Robust and secure voice communications platform
- Automated notification server
- Rainbow cloud-based collaboration platform

# Improve safety and security

Safety and security are major concerns for railway operators. People, systems and networks all need to be protected.

## Take a layered approach to security

A layered security approach starts at the switch level with a hardened operating system. It continues through application analytics, device security that includes finger printing and health checks, and policy-based access for users.

## Focus on IoT containment

With the increasing use of IoT devices in rail systems, the network has to be aware of these devices and be able to support and secure them.

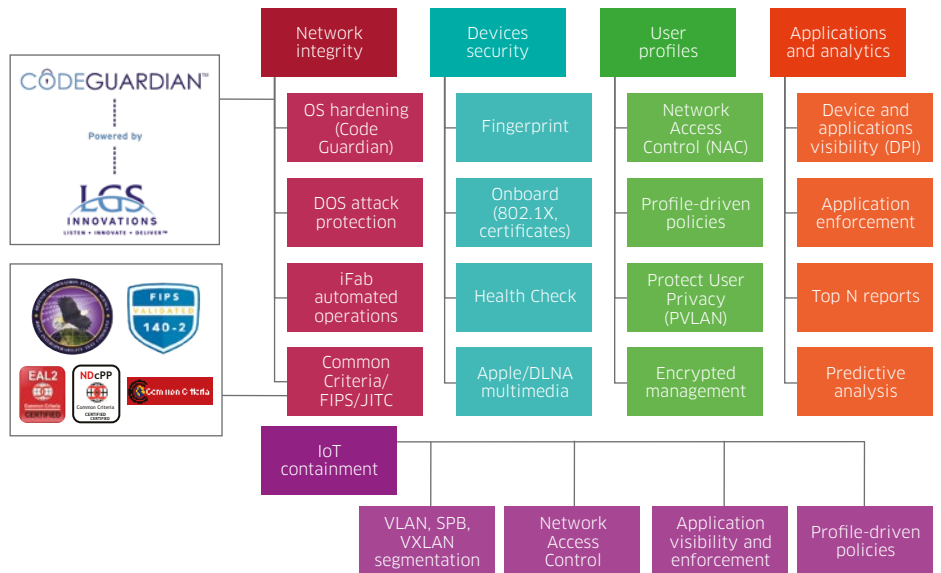
An IoT containment solution that combines virtualization, security and quality of service (QoS) provides excellent support for IoT operations while minimizing security risks. Policy-based access to IoT systems helps to prevent cyber attacks and data breaches from affecting, or reaching, other parts of the network.

## Look for built-in security

Built-in security features, such as technology scanning, are crucial to protect voice communications systems. Binary signatures, along with voice and signaling encryption all help to maintain confidentiality. And best practices such as call barring, alarms, monitoring and audit trails help to protect the system from direct cyber attacks.

## Improve safety communications and processes

A real-time notification server that supports geolocation and integrates with a CCTV system accelerates emergency response times and helps keep railway passengers and staff safe. Integrating the emergency conferencing and notification solution with the operations control center further improves safety. And adding a recording and call-tracking application provides the details needed for post-incident analysis and investigations.



## Make it happen

To increase safety and security, ask about our:

- Hardened operating system and automatic user-network profiles
- IoT containment solutions
- Policy-based access for users and devices
- Real-time emergency notification solution
- APIs for control center system integration
- Recording and call tracking systems

# Bringing IoT to the world's longest rail tunnel

"Nothing works in the Gotthard Base Tunnel without the switches from ALE."



The recently completed Gotthard Base Tunnel in Switzerland is a modern engineering wonder with a design to last a century. The engineers faced many challenges at all phases of the project, including how to:

- Connect 70,000 data points in extreme heat (more than 40° C), high humidity (more than 70 percent) and dust to enable voice and data communications
- Keep equipment from overheating using only convection cooling
- Deal with tight schedules, restricted space and limited access during construction and service

## The ALE solution included:

- Operational and emergency communications that are connected with the public address system

- A rugged network tunnel monitoring and control system
- More than 1000 ruggedized Ethernet switches
- Connectivity for 2500 CCTV IP cameras

## The benefits realized by AlpTransit included:

- Safe and reliable operation of high-speed passenger and freight trains
- Centralized monitoring and control from the Tunnel Control Center

With the ALE solution, the Gotthard Base Tunnel is designed to last 100 years with ruggedized switches to match.

## Want to learn more?

To learn more, visit: [enterprise.alcatel-lucent.com/industries/transportation/rail](http://enterprise.alcatel-lucent.com/industries/transportation/rail)

### Connected Transportation

At ALE, we are proud to have more than 100 rail customers worldwide. We help you connect rail systems with technology that works.

With global reach and local focus, we deliver networking and communications built for rail systems to deliver mobility, security and safety.

ALE | Where Everything Connects